TEST REPORT

No. : SHIN2007043011CM
Date : Aug 06, 2020

scan to see the report

SHIN2007043011CM

CUSTOMER NAME: CROWN HPL LIMITED

ADDRESS: A12, A13, 3/F., SHATIN INDUSTRIAL CENTRE, 5-7 YUEN SHUN CIRCUIT, SHATIN, NT, KOWLOON, HONG KONG

Sample Name : DECORATIVE REFRACTORY PLATE

Above information and sample(s) was/were submitted and confirmed by the client. SGS, however, assumes no responsibility to verify the accuracy, adequacy and completeness of the sample information provided by client.

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Test Required	:	Please see the next page(s)
SGS Ref. No.	:	SDFS2007004160RS
Ref. Standard	:	Please see the next page(s)
Date of Receipt	:	Jul 16, 2020
Testing Start Date	:	Jul 16, 2020
Testing End Date	:	Aug 06, 2020
Test result(s)	:	For further details, please refer to the following page(s) (Unless otherwise stated the results shown in this test report refer only to the sample(s) tested)

Signed for
SGS-CSTC Standards Technical Service (Shanghai)Co., Ltd.

Erin Huang
Authorized signatory

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Summary of Results:

No.	Test Item	Test Method	Result	Conclusion
1	Thickness	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 5	1.02 mm	Pass
2	Resistance to Surface Wear	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 10	250 r	Pass
3	Resistance to Immersion in Boiling Water	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 12	See Result	Pass
4	Resistance to Water Vapour	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 14	Rating 5	Pass
5	Resistance to Dry Heat	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 16	Rating 5	Pass
6	Dimension Stability at Elevated Temperature	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 17	See Result	Pass
7	Resistance to Impact by Large Diameter Ball	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 21	See Result	Pass
8	Resistance to Cracking under Stress	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 23	Rating 5	Pass
9	Resistance to Scratching	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 25	Rating 5	Pass
11	Resistance to Impact by Small-Diameter Ball	EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 20	43 N	Pass
12	Water Vapor Protection of Substrate	EN 438-2:2016+A1:2018 Clause 13	0.02mm	/

Note: Pass : Meet the requirements;
Fail : Does not meet the requirements;
/ : Not Apply to the judgment.

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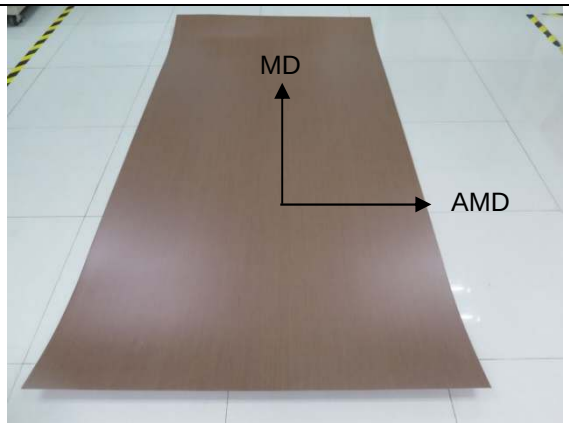
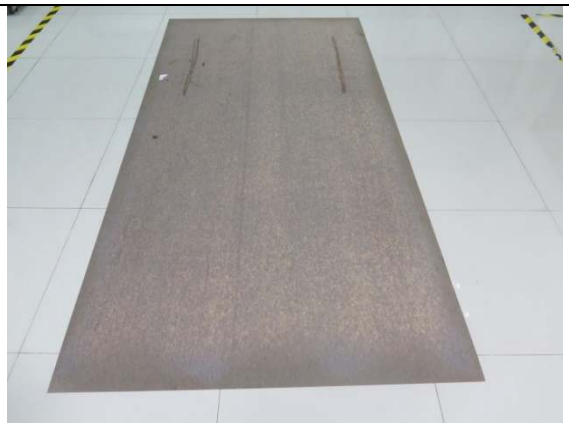
Original Sample Photo(s):

	
Front View	Back View

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TEST REPORT

1. Test Item: Thickness

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 5

Test Condition:

Specimen: Product, 1pc

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438-3:2016 Table 4	Conclusion
Thickness (mm)	1.02	1±0.10	Pass

Original Data:

Test Item	Test Result				
	Individual Value				Average Value
Thickness (mm)	1.01	1.02	1.01	1.03	1.02

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TEST REPORT

2. Test Item: Resistance to Surface Wear

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 10

Test Condition:

Specimen: 100mm×100mm×1mm, 3pcs

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Surface Wear - IP Value (r)	250	≥150	Pass

Original Data:

Test Item	Test Result			
	Individual Value			Average Value
Resistance to Surface Wear - IP Value (r)	250	250	300	250

Note: Test specimens were cut from original sample.

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TEST REPORT

3. Test Item: Resistance to Immersion in Boiling Water

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 12

Test Condition:

Specimen: 50mm×50mm×1mm, 4pcs

Test condition: Immersion in boiling water for 2h→ Immersion in cooling water (23℃) for 15min.

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item		Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Immersion in Boiling Water	Water absorption (%)	5.8	/	/
	Swelling in thickness (%)	4.5	/	/
	Surface rating scale	Rating 5	≥ Rating 3	Pass
	Edge rating scale	Rating 5	≥ Rating 3	Pass

Original Data:

Test Item		Test Result			
		Individual value			Average value
Resistance to Immersion in Boiling Water	Water Absorption (%)	5.5	6.3	5.7	5.8
	Swelling in Thickness (%)	4.9	3.9	5.0	4.5
		5.0	5.0	4.0	
		4.9	2.9	3.9	
		5.0	4.7	4.9	
	Surface Rating Scale	Rating 5	Rating 5	Rating 5	/
	Edge Rating Scale	Rating 5	Rating 5	Rating 5	/

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Note:

1) Test specimens were cut from original sample.

2) Surface rating scale:

Rating 5: No visible change

Rating 4: Slight change of gloss and/or colour, only visible at certain viewing angles

Rating 3: Moderate change of gloss and/or colour

Rating 2: Marked change of gloss and/or colour or surface blistering

Rating 1: Surface layers delamination

3) Edge rating scale:

Rating 5: No visible change

Rating 4: Slight hairline edge cracks visible to the naked eyes

Rating 3: Moderate edge cracks

Rating 2: Severe edge cracks

Rating 1: Core layers delamination

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TEST REPORT

4. Test Item: Resistance to Water Vapour

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 14

Test Condition:

Specimen: 100mm×100mm×1mm, 1pc

Test time: 1h

Test water: Boiling water

Lab environmental condition: 23±2℃, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Water Vapour	Rating 5	≥ Rating 3	Pass

Note:

1. Test specimens were cut from original sample.
2. Expression of results:

Rating 5: No visible change

Rating 4: Slight change of gloss and/or colour, only visible at certain viewing angles

Rating 3: Moderate change of gloss and/or colour

Rating 2: Marked change of gloss and/or colour

Rating 1: Blistering and/or delamination

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5. Test Item: Resistance to Dry Heat

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 16

Test Condition:

Specimen: 230mm×230mm×1mm, 1pc

Test temperature: 160℃

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test item	Test result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Dry Heat	Rating 5	≥Rating 3	Pass

Note: Test specimens were cut from original sample.

Rating scale:

Rating scale	Description
5	No change.Test area indistinguishable from adjacent surrounding area
4	Minor change Test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer's eye, e.g. discoloration, change in gloss and colour
3	Moderate change Test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour, no change in the surface structure, e.g. deformation, cracking, blistering
2	Significant change Test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour, and/or structure of the surface slightly changed, e.g. slight cracking, slight blistering
1	Strong change The structure of the surface being distinctly changed e.g. strong cracking, strong blistering and/or discoloration, change in gloss and colour, and/or the surface material being totally or partially delaminated

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TEST REPORT

6. Test Item: Dimension Stability at Elevated Temperature

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 17

Test Condition:

Specimen: 200mm×50mm×1mm, 8pcs (4pcs for each direction)

Dry heat test: 70℃, 24h

High humidity test: 40℃, 90%RH, 96h

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item		Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Dimension Stability at Elevated Temperature (%)	Machine direction	0.47	≤0.55	Pass
	Across-machine direction	0.62	≤1.05	Pass

Original Data:

Test item		Test result		
		Dry heat test	High humidity test	Mean
Dimensional stability at elevated temperature (%)	Machine direction	-0.44	0.03	0.47
	Across-machine direction	-0.40	0.22	0.62

Note: Test specimens were cut from original sample.

7. Test Item: Resistance to Impact by Large Diameter Ball

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 21

Test Condition:

Specimen: 230mm×230mm×1mm, 5pcs

Diameter of Steel ball: 42.8mm

Weight of Steel ball: 324g

Height of Impact: 800mm

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Impact by Large Diameter Ball - Indent Diameter (mm)	Max.: 8.82	≤10	Pass

Original Data:

Test Item	Test Result				
	1#	2#	3#	4#	5#
Indent Diameter (mm)	7.38	8.31	8.82	8.77	8.05
Appearance	No crack on the surface				

Note: Test specimens were cut from original sample.

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8. Test Item: Resistance to Cracking under Stress

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 23

Test Condition:

Specimen: 150mm×50mm×1mm, 4pcs

Test temperature: 50℃, 6h

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Cracking under Stress	Rating 5	≥ Rating 4	Pass

Note: Test specimens were cut from original sample.

Rating scale:

Rating 5: No evidence of cracking

Rating 4: Hairline cracks only visible under ×6 magnification

Rating 3: Cracks visible with normal vision (corrected if necessary) from the edge of the hole, but not extending to either edge of the specimen

Rating 2: A crack visible with normal vision (corrected if necessary) from the edge of the hole, extending to one edge of the specimen such that the specimen is not broken into two pieces

Rating 1: Specimen broken into two pieces

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TEST REPORT

9. Test Item: Resistance to Scratching

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 25

Test Condition:

Specimen: 100mm×100mm×1mm, 1pc

Rubbing stylus: Hemispherical diamond scratching point of radius (0.09±0.003)mm and an included angle of (90±1)°

Rotational frequency: (5±1)min^{-1}

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item	Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Scratching	Rating 5	≥ Rating 2	Pass

Note:

1) Test specimens were cut from original sample.

2) According to EN 438-2:2016 table 6 rating scale as follow:

Rating	Discontinuous scratches, or faint superficial marks, or no visible marks	≥90% continuous double circle of scratch marks clearly visible
Rating 5	6N	>6N
Rating 4	4N	6N
Rating 3	2N	4N
Rating 2	1N	2N
Rating 1	-	1N

TEST REPORT

10. Test Item: Resistance to Staining

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 26

Test Condition:

Specimen: 100mm×100mm×1mm, 5pcs

Lab Environmental Condition: 23±2℃, 50±5%RH

Test Result:

Test Item		Test Result	Requirement in EN 438-3:2016 Table 5 HGS	Conclusion
Resistance to Staining	Acetone	Rating 5	≥ Rating 5	Pass
	120g/L Coffee	Rating 5	≥ Rating 5	Pass
	25% Sodium hydroxide	Rating 5	≥ Rating 4	Pass
	30% Hydrogen peroxide	Rating 5	≥ Rating 4	Pass
	Carbon black suspension in paraffin oil (Shoe polish simulant)	Rating 5	≥ Rating 4	Pass

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Note:

1) Test specimens were cut from original sample.

2) Rating code:

Numerical rating	Description
5	No change Test area indistinguishable from adjacent surrounding area
4	Minor change Test area distinguishable from adjacent surrounding area, only when the light source is mirrored on the test surface and is reflected towards the observer's eye, e.g. discoloration, change in gloss and colour
3	Moderate change Test area distinguishable from adjacent surrounding area, visible in several viewing directions, e.g. discoloration, change in gloss and colour
2	Significant change Test area clearly distinguishable from adjacent surrounding area, visible in all viewing directions, e.g. discoloration, change in gloss and colour, and/or structure of the surface slightly changed, e.g. cracking, blistering
1	Strong change The structure of the surface being distinctly changed and/or discoloration, change in gloss and colour, and/or surface material being totally or partially delaminated

11. Test Item: Resistance to Impact by Small-Diameter Ball

Test Method: EN 438-3:2016 Clause 6 & EN 438-2:2016 Clause 20

Test Result:

Test Item	Test procedures/requirements	Rating/ Result
Resistance to Impact by Small-Diameter Ball	The test shall be carried out in the laboratory atmosphere. Place the steel plate on a convenient rigid horizontal surface and locate the specimen on it with its decorative surface uppermost. Fix the impact tester in its support fixture, load the tester, place the assembly on the specimen and release the impact bolt. Start preliminary test with a spring force of 10 N and increase by 5 N on each occasion to determine the minimum spring force at which the surface of the specimen shows damage due to impact stress. Test further specimens for the final determination of the maximum force at which no damage occurs. For this purpose, start with the spring force determined in the preliminary test and reduce it in suitable stages, for example 1 N, after every five strikes. To make any damage more easily visible, the surface of the specimen shall be rubbed with a contrast medium after the test. The distance between points of impact shall be at least 20 mm and between points of impact and the edge of the specimen at least 30 mm. Examine the surface tested for damage at the points of impact. For the purpose of this test, damage is defined by the presence of fine hairline cracks (which are frequently concentric), continuous cracks or flaking of the decorative surface. Indentations without cracks do not count as damage. If the test is conducted only to determine whether the impact strength of a material exceeds a limiting value, the specimen shall sustain no damage after five successive individual impact strikes with the prescribed spring force.	Max resistance to impact force: 43 N

TEST REPORT

12. Test Item: Water Vapor Protection of Substrate

Test Method: EN 438-2:2016+A1:2018 Clause 13

Test Condition:

Specimen: 100mm×100mm×1.00mm, 2pcs

Treatment condition: Steam, 1h

Test result:

Test item	Test result
Water Vapor Protection of Substrate	0.02mm

Note: The test was performed by SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center.

******** End of report********

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